Introduction

This report is designed to meet the requirements for quarterly reporting for the FCC's Rural Healthcare Pilot Program as described in FCC Order 07-198 for the period ending 10/31/09 for the North Carolina Telehealth Network (NCTN). The report format is modeled after the reporting requirements in the order.

Each major section has the term "UPDATED" or "NOT UPDATED" inserted after the section number. "UPDATED" indicates that some material change to the section has been made since the last report.

The updates are visible by looking at the document in "Final Showing Markup" mode. Otherwise, reviewing the document in "Final" mode will hide the distinction between updated and prior material. For sections that explicitly ask for updates only, an updated section will contain only the updated materials.

1. UPDATED: Project Contact and Coordination Information

a. Identify the project leader(s) and respective business affiliations.

The project's coordinator is Dr. William F. Pilkington in his role as the Director of the Cabarrus Health Alliance and the lead agency for the NC Southern Piedmont Partnership for Public Health. Mr. David Kirby, President of Kirby Information Management Consulting, LLC (Kirby IMC) is the Assistant PC. Mr. Jason Baisden, CTO for the NC Association of Free Clinics is an active participant representing the NCAFC members. The e-NC Authority has been contracted as of September to participate as a major part of the program management effort during the network development phase in collaboration with Kirby IMC. The e-NC Authority is a part of state government whose mission is to promote broadband usage throughout North Carolina. Ms. Jane Patterson is the Executive Director of e-NC.

b. Provide a complete address for postal delivery and the telephone, fax, and e-mail address for the responsible administrative official.

Dr. William F. Pilkington

1307 S Cannon Boulevard
Kannapolis, NC 28083-6232

704-920-1203
William.Pilkington@CabarrusHealth.org

c. Identify the organization that is legally and financially responsible for the conduct of activities supported by the award.

The Public Health Authority of Cabarrus County (d.b.a Cabarrus Health Alliance)

d. Explain how project is being coordinated throughout the state or region.

The NCAFC represents the free clinics in the state both generally and for the purposes of this project.

The local health departments who are participating in the state are to be formally represented by CHA (Cabarrus Health Alliance). The NC Association of Local Health Directors and the NC Division of Public Health are also significantly involved in the project as coordinating organizations for the local public health departments.

Deleted: The four NC projects that are RHCPP participants have agreed to form an informal group to meet quarterly to better coordinate their efforts.

The four NC RHCPP recipients are now formally merged with the leaders of the other three former projects continuing as advisers to the merged project. The newly merged discount opportunities are to be used to support a program to provided broadband services to NC's hospitals. We plan to offer this to both the for public non-profits and private hospitals- with the private hospitals who accept service not having access to the RHCPP discounts.

A collateral benefit of e-NC's involvement in the project is that it also operates development efforts for broadband deployments of various types throughout NC and so will be well positioned to advise how to best leverage the RHCPP effort in the larger context of these other broadband projects.

2. UPDATED: Identify all health care facilities included in the network.

a. Provide address (including county), zip code, Rural Urban Commuting Area (RUCA) code (including primary and secondary), six-digit census tract, and phone number for each health care facility participating in the network.

The NCTN-PH (public health and free clinics) part of the network is now in the RFP pahse. So, the 465 attachment listing the included sites is now public. The NCTN-H (hospitals) part of the project is just now underway and has not yet collected the site information. We are expecting virtually every public non-profit hospital in NC (about 104) to participate and about half of the 30 private hospitals.

b. For each participating institution, indicate whether it is:

i. Public or non-public;
ii. Not-for-profit or for-profit;
iii. An eligible health care provider or ineligible health-care provider with an explanation of why the health care facility is eligible under section 254 of the 1996 Act and the Commission's rules or a description of the type of ineligible health care provider entity.

For NCTN-PH - All of the approximately 240 sites in the NCTN are operated by local (i.e. non-state) North Carolina public health agencies and free clinics (501c3 type organizations). There may be a de minimus number of sites that wish to share broadband facilities with non-eligible entities (e.g. a county local health agency sharing with other county government departments). For these "shared" sites we plan to use a "fair share" approach to discount requests. Our reading of the Act and the 07-198 order lead us to conclude that all of the NCTN sites will be therefore eligible for discounted broadband services. Moreover, we do not plan to include non-eligible entities in the network.

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We also plan to connect to at least one consortium datacenter. This is the datacenter in Raleigh NC that serves the EMR and other applications for use by the local public health sites who are users of the NCTN. Our current understanding is that this connection is eligible for RHCPP funds.

For NCTN-H – We expect about 104 hospital entities to be public non-profits and at about 15 of the 30 private hospitals in NC to participate.

3. NOT UPDATED: Network Narrative: In the first quarterly report following the completion of the competitive bidding process and the selection of vendors, the selected participant must submit an updated technical description of the communications network that it intends to implement, which takes into account the results its network design studies and negotiations with its vendors. This technical description should provide, where applicable:

a. Brief description of the backbone network of the dedicated health care network, e.g., MPLS network, carrier-provided VPN, a SONET ring;
b. Explanation of how health care provider sites will connect to (or access) the network, including the access technologies/services and transmission speeds;
c. Explanation of how and where the network will connect to a national backbone such as NLR or Internet2;
d. Number of miles of fiber construction, and whether the fiber is buried or aerial;
e. Special systems or services for network management or maintenance (if applicable) and where such systems reside or are based.

We have not completed the competitive bidding process as of the due date of this report.

4. NOT UPDATED: List of Connected Health Care Providers: Provide information below for all eligible and non-eligible health care provider sites that, as of the close of the most recent reporting period, are connected to the network and operational.

a. Health care provider site;
b. Eligible provider (Yes/No);
c. Type of network connection (e.g., fiber, copper, wireless);
d. How connection is provided (e.g., carrier-provided service; self-constructed; leased facility);
e. Service and/or speed of connection (e.g., DS1, DS3, DSL, OC3, Metro Ethernet (10 Mbps);
f. Gateway to NLR, Internet2, or the Public Internet (Yes/No);
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g. Site Equipment (e.g., router, switch, SONET ADM, WDM), including manufacturer name and model number.
h. Provide a logical diagram or map of the network.

No sites are connected to the network as of this time.

5. NOT UPDATED: Identify the following non-recurring and recurring costs, where applicable shown both as budgeted and actually incurred for the applicable quarter and funding year to-date.

a. Network Design
b. Network Equipment, including engineering and installation
c. Infrastructure Deployment/Outside Plant
i. Engineering
ii. Construction
d. Internet2, NLR, or Public Internet Connection
e. Leased Facilities or Tariffed Services
f. Network Management, Maintenance, and Operation Costs (not captured elsewhere)
g. Other Non-Recurring and Recurring Costs

No funds of any type have been expended of the types listed above. For future reference, it would help us to know whether this reporting entry is limited to costs for which we have received RHCPP discounts or you want to see all costs paid with funds from any source. Please advice.

6. UPDATED Describe how costs have been apportioned and the sources of the funds to pay them:

a. Explain how costs are identified, allocated among, and apportioned to both eligible and ineligible network participants.
b. Describe the source of funds from:
i. Eligible Pilot Program network participants
ii. Ineligible Pilot Program network participants
c. Show contributions from all other sources (e.g., local, state, and federal sources, and other grants).
i. Identify source of financial support and anticipated revenues that is paying for costs not covered by the fund and by Pilot Program participants.
ii. Identify the respective amounts and remaining time for such assistance.
d. Explain how the selected participant's minimum 15 percent contribution is helping to achieve both the selected participant's identified goals and objectives and the overarching goals of the Pilot Program.

As noted above, there have been no actual costs of any type to report to date that relate to the items listed in this question. The "Project Scope Reform" section above does describe the funding sources and uses that we plan to finance the network during the RHCPP's life. That text is repeated here:

-In designing the NCTN-PH network we plan to make use of a small amount of seed funding from the NC Division of Public Health ($125K) to pay for program management costs.

-In the implementing and operating phase of the NCTN-PH network's life (approx 4 years) we plan to use a subscription model in which the eligible sites provide the 15% matching funds from their own funds and a small fee to support program management activities. Given the expected number of sites and our current estimates of the cost per site, we can expect to spend the RHCPP-based funding over the 4 operational years (i.e. the life of the RHCPP).

-In designing the NCTN-H network we plan to make use of a small amount of seed funding from the Golden Leaf Foundation ($100K) to pay for program management costs.

-In the implementing and operating phase of the NCTN-H network's life (approx 4 years) we plan to use a subscription model in which the eligible sites provide the 15% matching funds from their own funds and a small fee to support program management activities. Given the expected number of sites and our current estimates of the cost per site, we can expect to spend the RHCPP-based funding over the 4 operational years (i.e. the life of the RHCPP).

7. NOT UPDATED: Identify any technical or non-technical requirements or procedures necessary for ineligible entities to connect to the participant's network.

For the NCTN-PH - As of now we don't plan to offer service to ineligible entities. We may have a small number of sites who share the broadband facilities (e.g. a local county public health agency sharing with other county departments). We plan to use a "fair share" arrangement to segment the eligible and non-eligible traffic on these "sharing" sites.

For the NCTN-H – We plan to offer connection to private hospitals in NC. The terms of connection will be exactly the same as for RHCPP-eligible hospitals except that RHCPP discounts will not be provided to ineligible entities or to portions of otherwise eligible entities that are not eligible. These terms will be spelled out in an NCTN Subscription Agreement. The key technical connection requirement for each site is to interconnect with an ordinary Ethernet port on the service provider's CPE.

8 UPDATED: Provide on update on the project management plan, detailing:

a. The project's current leadership and management structure and any changes to the management structure since the last data report; and

August, September, and October 2008: The e-NC Authority has been contracted as of early October to participate as a major part of the program management effort during the network development phase in collaboration with Kirby IMC. Jane Patterson is the Executive Director of e-NC.

b. In the first quarterly report, the selected applicant should provide a detailed project plan and schedule. The schedule must provide a list of key project deliverables or tasks, and their anticipated completion dates. Among the deliverables, participants must indicate the dates when each health care provider site is expected to be connected to the network and operational. Subsequent quarterly reports should identify which project deliverables, scheduled for the previous quarter, were met, and which were not met. In the event a project deliverable is not achieved, or the work and deliverables deviate from the work plan, the selected participant must provide an explanation.

August, September, October 2008:

The first quarterly report noted that the provision of program management funds was a precursor to the start of Phase 1. The acquisition of the funds and their application to formal contracts with Kirby IMC and e-NC occurred in early October. This group has met and created a more detailed inventory of activities for each party and is now proceeding with Phase 1.

November, December 2008 , January 2009- The work group has decided to pursue a two-phase approach rather than the previous 3 phase approach by combining the net design, implementation, and operations RFP and contracting elements into phase 1 in a single RFP. We came to this decision by observing that the minimal amount of design work to be done for the NCTN would be more efficiently managed by a single RFP that included the design, implementation and operations elements. The updated project phasing is as outlined below:

The project is divided into two phases with key deliverables in each phase shown below. Completing the first phase is dependent on the delivery of non-RHCPP funding for matching funds and program management funds for that phase. Those funds are currently awaiting the completion of the state's budget process for this year. While work is ongoing in phase 1, we won't have dependable dates for its completion until the non-RHCPP funding noted above is in hand.

Phase 1- Forming RFP and subscribing NCTN members (approximately 1-2 months)
Key deliverables:
-Letters of Agency from the eligible entities
-NCTN Subscription Agreement from the eligible entities
-Completed site dataset – with data needed to support network design/implementation and needed to support formal demonstration of eligibility.
- RFP suitable for supporting competitive bidding for the network design, implementation, operation, and tracking process.
- Acquisition of funding commitment letter (FCL) for eligible work done in phase 2
- Completion of competitive bid for RFP;
- Selection process for bid award.

- Selection and announcement of bidder for work in phase 2

Phase 2- NCTN implementation/operations (approximately four years total with operations starting about 3 months after the start of this phase)
Key deliverables:

- Implementation of services and financial/administrative operations.
- Operation of services and financial/administrative operations.

February, March, April 2009 – There has been significant discussion about the other three RHCPP selectees in NC merging with the NCTN project. The Southwestern Commission has agreed in writing to formally request a merger. The UHS and Albemarle Regional projects have made positive comments about merging and expect to come to a decision on a call scheduled for 4/30/09. If the decision is to merge, we will seek a formal merger soon thereafter. The nature of the merger involves using the $6.4M from the other three projects to build out a network for eligible hospitals in NC similar to the NCTN component servicing public health and free clinic sites. We plan to develop a separate RFP (almost identical to the first RPF) for this hospital part of the network so as not delay the development of the NCTN component to support the public health and free clinic sites. The program management funds for the hospital project are expected to come from a grant. The new hospital sites will have representation at the NCTN Association to be developed as part of the sustainability plan.

July 2009- The four projects have formally requested to be merged. The FCC/USAC are completing the last elements of responding formally to the request. We are currently predicting that the formal response (and a positive one) will be forthcoming by 8/1/09.

October 2009 – The four NC RHCPP projects are now formally merged. The NCTN-H project is underway with the NC Institute for Public Health as the lead project manager for this part of the work. The work has progressed to the point that the likely hospital subscribers have been notified (by the NC Hospital Association), the project is fully staffed and has a tentative plan to complete the network by Fall 2010.

We have asked for an extension (via Tom Buckley and Ernesto Beckford) to the June 2010 deadline for FCLs in order to assure that this new part of the work (i.e. NCTN-H) will not miss the deadline for FCL issue.

The RFP for the NCTN-PH is now past the ACD. We have held a vendor conference and have received letters of intent to bid from several reputable vendors. The level of questions indicates that these vendors have a serious interest in the project. (See http://nctelehealthnetwork.com) We currently plan to have proposal from vendors by 11/4/09.

9. NOT UPDATED: Provide detail on whether network is or will become self sustaining. Selected participants should provide an explanation of how network is self sustaining.

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NCTN Sustainability Plan

Overview:
Today, each of the eligible NCTN sites obtains broadband services as an entirely local process- one free clinic at a time, one local health department at a time. This process has risks and limitations that frequently result in sites having inadequate facilities and paying higher prices for those facilities. Generally, the acquisition of these broadband facilities is not coordinated to reduce prices, improve service, or to aid program collaboration among the sites.

Yet, these programs (i.e. in free clinics and local public health agencies) are more frequently seeking to collaborate both on their own initiative and at the urging of their influential partners. The usual goal is to collaborate and cooperate at the program level in order to provide better health-related services at lower costs.

These conditions set the stage for greater cooperation in the area of broadband services among the NCTN subscribers in order to achieve the programmatic results that are being demanded of them now. Therefore, the key areas of cooperation relevant to this NCTN Project are: 1) to work for better value in broadband services per se and 2) for better program services via use of new broadband-dependent technologies at lower costs and to improve the quality of program services for the public. Item 10 below provides more detail on how the use of technology that requires the types of services planned for the NCTN contributes to meeting these program challenges.

This shift towards more need for collaboration among NCTN members and greater use of networked applications, especially in the area of operational information sharing, is the basic motive for a sustainable network. The RHCPP is a way for us to build on that motive. During the RHCPP's life, these sites and other key organizations will work to form and operate the NCTN. Doing so is expected to create the level and type of awareness, understanding, and commitment needed to continue the NCTN after the RHCPP ends.

As noted elsewhere, we plan to use some of the time and non-RHCPP funds in the early part of the project to explore forming a 501c3. It will likely be titled the NCTN Association – an association of NCTN subscribers. This association could be reasonably expected to provide the organizational focus to continue and expand NCTN operations and do so in a way that can build and leverage a level of expertise and buying power in the area of broadband services for non-profit health facilities. Such an organization would also be well positioned to respond to the current RHC program and any of the changes in FCC policy that the RHCPP is designed to foster. We expect that two likely (and welcomed) FCC policy changes fostered by the RHCPP will be: A) embellished support for discounted broadband services for public and non-profit health care providers to the extent of available funds and B) greater usage of available funds by a policy of supporting the distribution and usage of the funds through consortia of eligible entities such as the NCTN Association. However, our sustainability model does not critically depend on any of these changes.

With these trends and needs in mind as motives, the NCTN Association can be reasonably expected to combine discount support, volume buying power, reduced costs (e.g. more teleeducation vs. travel-based education), reduction of operations costs using EMR, more effective reimbursement processes, and greater expertise under the management of the public and non-profit health care providers/subscribers to create, evolve, and operate the NCTN in a sustainable manner.

These value adds alone can be expected to make the NCTN be the preferred vehicle for broadband services for these eligible sites both during the life of the RHCPP and thereafter. But, we are also aware that there are several targets of opportunity for funding in later years that we will pursue (but not depend on) for sustainability. Today, those opportunities include: 1) the traditional RHC program more than ½ of the sites are RHC eligible) 2) funds provided pursuant to (or as a consequence of) the so-called HIT stimulus elements of the bill now pending in Congress 3) an updated RHC program with opportunities based on results from the RHCPP program as the FCC intended in its initial order requesting RHCPP proposals 4) other Federal and state programs to support broadband connectivity that includes RHCPP eligible entities.

Key sustainability points

While we intend to explore the other options noted above for paying for the NCTN services after the RHCPP ends, we have designed the project so that the participants can be reasonably expected to be able to pay the full price of continuing the services after the RHCPP ends.

To start, the 15% matching funds during the RHCPP come from the ordinary operating budgets of the entities who are using the NCTN broadband services. This amount will be about 15-20% of what these sites pay now for broadband services.

We have crafted the RFP so as to induce bids that will not require dramatically more funding per site than sites now pay for their existing broadband connections if the sites had to pay in full.

While we are not actively seeking ineligible network subscribers, we do allow for them. They will pay the full price for the services from the Standard Pricing Schedule plus the NCTN subscription fee. They will be represented in the NCTN Association.

The sustainability period for such an approach is indefinite (certainly 20 years, perhaps more). Our assumption is that over the long run, the cost of the needed facilities will continue to be, at maximum, what it is in nominal dollars. The costs in 2009 dollars will likely shrink at about the general rate of inflation (assumed to be 3%). While these improvements in price performance are likely, the sustainability of the network does not critically depend on them.

The NCTN is posed as more than a physical network. It is also a community of similar entities seeking to leverage their influence to assure that their networking needs are supported in the long run. Both of the key groups (the public health agencies and the free clinics) are accustomed to working as groups and with other groups to achieve such aims. Doing so in the NCTN context is, therefore, culturally normal for them. Each NCTN subscriber will be bound by a subscription agreement that includes the rights and responsibilities of each subscriber and of the NCTN Administrator (now Cabarrus Health Alliance, later the NCTN Association). The subscribers pay a subscription fee that goes to provide the long term funds for the administration of the NCTN and support for NCTN Association activities (approximately $100k per year total).

The RFP is designed to attract proposals that will offer services based on recurring fees only. These fees will include the costs for the management of the network. Note that “management” in this context means the technical operations of the network. Program administration is paid for as noted above and executed by CHA/NCTNA. So, we don’t plan to own any facilities or excess capacity. This approach inherently depends on partnering with vendors who build the infrastructure needed to supply the services and to provide pricing that reflects the competitive price of the services. We’ve therefore chosen to be in a position to buy services based on competitive pricing from vendors both

during the RHCPP and in the post-RHCPP era rather than be asset owners of potentially non-fungible networking facilities. We believe that this is the better approach for the types of entities that we are trying to serve in this network.

Four budgets for the NCTN-PH are shown below: Budget 1 shows the annual funds flow based on the conservative projection that the sites themselves will pay for the network services in full. Budget 2 shows the effect of participation in the current RHC program. Budget 3 shows the effect of a theoretically reformed RHC program that would provide 85% discounts. Budget 4 shows the effect of applying the model in budget 3 to all public health and free clinics in the U.S. The chief figure of note in budget 4 is the $38,133,720 per year for the reformed RHC program to provide 85% support to all public health and free clinics in the U.S. This is a bit less than 10% of the yearly allocation available for the RHC, as we understand it. This last point is made to help better understand the practicality of a reformed RHC supporting an 85% discount.

The sustainability points for the NCTN-H are substantially the same as for the NCTN-PH.

The budgets below are embedded. So you can double click them to see them in Excel.

NCTN Budget 1 - Conservative model that assumes that sites pay full costs after RHCPP ends.
Note that we assume that the cost of an adequate broadband service will stay the same in nominal dollars over these twenty years.
The average site today pays $40

Calendar Year	Number of sites	Average monthly cost per site for network services	Subscription fee per site/ month	Percent of costs paid by the sites	Full cost of network services per CY (with $600/mo average per site)	Network service costs paid by sites per CY	Subscrption fees (from subscribers) per CY	Average network service s cost paid by site per month	Total average cost to site per month (i.e. service plus subscription fee)	Total monthly cost to site in 2009 dollars (assuming 3% inflation)	Total RHCPP discounts paid to vendor per CY	Accumulated RHCPP funds used
CY2009 (last quarter only)	230	600	40	15%	414,000	62,100	27,600	90	130	130	351,900	351,900
CY2010	230	600	40	15%	1,656,000	248,400	110,400	90	130	126	1,407,600	1,759,500
CY2011	230	600	40	15%	1,656,000	248,400	110,400	90	130	122	1,407,600	3,167,100
CY2012	230	600	40	15%	1,656,000	248,400	110,400	90	130	119	1,407,600	4,574,700
CY2013	230	600	40	15%	1,656,000	248,400	110,400	90	130	115	1,407,600	5,982,300
CY2014	230	600	40	100%	1,656,000	1,656,000	110,400	600	640	112	0	5,982,300
CY2015	230	600	40	100%	1,656,000	1,656,000	110,400	600	640	533	0	5,982,300
CY2016	230	600	40	100%	1,656,000	1,656,000	110,400	600	640	517	0	5,982,300
CY2017	230	600	40	100%	1,656,000	1,656,000	110,400	600	640	502	0	5,982,300
CY2018	230	600	40	100%	1,656,000	1,656,000	110,400	600	640	487	0	5,982,300
CY2019	230	600	40	100%	1,656,000	1,656,000	110,400	600	640	472	0	5,982,300
CY2020	230	600	40	100%	1,656,000	1,656,000	110,400	600	640	458	0	5,982,300
CY2021	230	600	40	100%	1,656,000	1,656,000	110,400	600	640	444	0	5,982,300
CY2022	230	600	40	100%	1,656,000	1,656,000	110,400	600	640	431	0	5,982,300
CY2023	230	600	40	100%	1,656,000	1,656,000	110,400	600	640	418	0	5,982,300
CY2024	230	600	40	100%	1,656,000	1,656,000	110,400	600	640	405	0	5,982,300
CY2025	230	600	40	100%	1,656,000	1,656,000	110,400	600	640	393	0	5,982,300
CY2026	230	600	40	100%	1,656,000	1,656,000	110,400	600	640	381	0	5,982,300
CY2027	230	600	40	100%	1,656,000	1,656,000	110,400	600	640	370	0	5,982,300
CY2028	230	600	40	100%	1,656,000	1,656,000	110,400	600	640	359	0	5,982,300

NCTN Budget 2 - This model that assumes that sites pay costs not covered by RHC after RHCPP ends. (assume 5% RHC support)
Note that we assume that the cost of an adequate broadband service will stay the same in nominal dollars over these twenty years.
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Calendar Year	Number of sites	Average monthly cost per site for network services	Subscription fee per site/ month	Percent of costs paid by the sites	Full cost of network services per CY (with $600/mo average per site)	Network service costs paid by sites per CY	Subscrption fees (from subscribers) per CY	Average network service s cost paid by site per month	Total average cost to site per month (i.e. service plus subscription fee)	Total monthly cost to site in 2009 dollars (assuming 3% inflation)	Total RHCPP discounts paid to vendor per CY through CY2013; RHC discounts thereafter	Accumulated RHCPP/RHC funds used
CY2009 (last quarter only)	230	600	40	15%	414,000	62,100	27,600	90	130	130	351,900	351,900
CY2010	230	600	40	15%	1,656,000	248,400	110,400	90	130	126	1,407,600	1,759,500
CY2011	230	600	40	15%	1,656,000	248,400	110,400	90	130	122	1,407,600	3,167,100
CY2012	230	600	40	15%	1,656,000	248,400	110,400	90	130	119	1,407,600	4,574,700
CY2013	230	600	40	15%	1,656,000	248,400	110,400	90	130	115	1,407,600	5,982,300
CY2014	230	600	40	95%	1,656,000	1,573,200	110,400	570	610	112	82,800	6,065,100
CY2015	230	600	40	95%	1,656,000	1,573,200	110,400	570	610	508	82,800	6,147,900
CY2016	230	600	40	95%	1,656,000	1,573,200	110,400	570	610	493	82,800	6,230,700
CY2017	230	600	40	95%	1,656,000	1,573,200	110,400	570	610	478	82,800	6,313,500
CY2018	230	600	40	95%	1,656,000	1,573,200	110,400	570	610	464	82,800	6,396,300
CY2019	230	600	40	95%	1,656,000	1,573,200	110,400	570	610	450	82,800	6,479,100
CY2020	230	600	40	95%	1,656,000	1,573,200	110,400	570	610	436	82,800	6,561,900
CY2021	230	600	40	95%	1,656,000	1,573,200	110,400	570	610	423	82,800	6,644,700
CY2022	230	600	40	95%	1,656,000	1,573,200	110,400	570	610	411	82,800	6,727,500
CY2023	230	600	40	95%	1,656,000	1,573,200	110,400	570	610	398	82,800	6,810,300
CY2024	230	600	40	95%	1,656,000	1,573,200	110,400	570	610	386	82,800	6,893,100
CY2025	230	600	40	95%	1,656,000	1,573,200	110,400	570	610	375	82,800	6,975,900
CY2026	230	600	40	95%	1,656,000	1,573,200	110,400	570	610	363	82,800	7,058,700
CY2027	230	600	40	95%	1,656,000	1,573,200	110,400	570	610	353	82,800	7,141,500
CY2028	230	600	40	95%	1,656,000	1,573,200	110,400	570	610	342	82,800	7,224,300

NCTN Budget 3 - Model that assumes that sites pay costs not coverd by reformed RHC after RHCPP ends. (i.e. 85% reformed RHC support)
Note that we assume that the cost of an adequate broadband service will stay the same in nominal dollars over these twent

Calendar Year	Number of sites	Average monthly cost per site for network services	Subscription fee per site/ month	Percent of costs paid by the sites	Full cost of network services per CY (with $600/mo average per site)	Network service costs paid by sites per CY	Subscrption fees (from subscribers) per CY	Average network service s cost paid by site per month	Total average cost to site per month (i.e. service plus subscription fee)	Total monthly cost to site in 2009 dollars (assuming 3% inflation)	Total RHCPP discounts paid to vendor per CY through CY2013; **Reformed RHC discounts thereafter**	Accumulated RHCPP/RHC funds used
CY2009 (last quarter only)	230	600	40	15%	414,000	62,100	27,600	90	130	130	351,900	351,900
CY2010	230	600	40	15%	1,656,000	248,400	110,400	90	130	126	1,407,600	1,759,500
CY2011	230	600	40	15%	1,656,000	248,400	110,400	90	130	122	1,407,600	3,167,100
CY2012	230	600	40	15%	1,656,000	248,400	110,400	90	130	119	1,407,600	4,574,700
CY2013	230	600	40	15%	1,656,000	248,400	110,400	90	130	115	1,407,600	5,982,300
CY2014	230	600	40	15%	1,656,000	248,400	110,400	90	130	112	1,407,600	7,389,900
CY2015	230	600	40	15%	1,656,000	248,400	110,400	90	130	108	1,407,600	8,797,500
CY2016	230	600	40	15%	1,656,000	248,400	110,400	90	130	105	1,407,600	10,205,100
CY2017	230	600	40	15%	1,656,000	248,400	110,400	90	130	102	1,407,600	11,612,700
CY2018	230	600	40	15%	1,656,000	248,400	110,400	90	130	99	1,407,600	13,020,300
CY2019	230	600	40	15%	1,656,000	248,400	110,400	90	130	96	1,407,600	14,427,900
CY2020	230	600	40	15%	1,656,000	248,400	110,400	90	130	93	1,407,600	15,835,500
CY2021	230	600	40	15%	1,656,000	248,400	110,400	90	130	90	1,407,600	17,243,100
CY2022	230	600	40	15%	1,656,000	248,400	110,400	90	130	87	1,407,600	18,650,700
CY2023	230	600	40	15%	1,656,000	248,400	110,400	90	130	85	1,407,600	20,058,300
CY2024	230	600	40	15%	1,656,000	248,400	110,400	90	130	82	1,407,600	21,465,900
CY2025	230	600	40	15%	1,656,000	248,400	110,400	90	130	80	1,407,600	22,873,500
CY2026	230	600	40	15%	1,656,000	248,400	110,400	90	130	77	1,407,600	24,281,100
CY2027	230	600	40	15%	1,656,000	248,400	110,400	90	130	75	1,407,600	25,688,700
CY2028	230	600	40	15%	1,656,000	248,400	110,400	90	130	73	1,407,600	27,096,300

NCTN Budget 4 - Model for the entire U.S. public health and free clinics (approx 6750 sites = 2875 LHD * 1.75 sites/LHD + 1200 = 6231) that assumes that sites pay costs not coverd by reformed RHC after RHCPP ends. (i.e. 85% reformed RHC discount)
Note

Calendar Year	Number of sites (estimate)	Average monthly cost per site for network services	Subscription fee per site/month	Percent of costs paid by the sites	Full cost of network services per CY (with $600/mo average per site)	Network service costs paid by sites per CY	Subscrption fees (from subscribers) per CY	Average network service s cost paid by site per month	Total average cost to site per month (i.e. service plus subscription fee)	Total monthly cost to site in 2009 dollars (assuming 3% inflation)	Total RHCPP discounts paid to vendor per CY through CY2013; **Reformed RHC discounts thereafter**	Accumulated RHCPP/RHC funds used
CY2009 (last quarter only)	6231	600	40	15%	11,215,800	1,682,370	747,720	90	130	130	9,533,430	9,533,430
CY2010	6231	600	40	15%	44,863,200	6,729,480	2,990,880	90	130	126	38,133,720	47,667,150
CY2011	6231	600	40	15%	44,863,200	6,729,480	2,990,880	90	130	122	38,133,720	85,800,870
CY2012	6231	600	40	15%	44,863,200	6,729,480	2,990,880	90	130	119	38,133,720	123,934,590
CY2013	6231	600	40	15%	44,863,200	6,729,480	2,990,880	90	130	115	38,133,720	162,068,310
CY2014	6231	600	40	15%	44,863,200	6,729,480	2,990,880	90	130	112	38,133,720	200,202,030
CY2015	6231	600	40	15%	44,863,200	6,729,480	2,990,880	90	130	108	38,133,720	238,335,750
CY2016	6231	600	40	15%	44,863,200	6,729,480	2,990,880	90	130	105	38,133,720	276,469,470
CY2017	6231	600	40	15%	44,863,200	6,729,480	2,990,880	90	130	102	38,133,720	314,603,190
CY2018	6231	600	40	15%	44,863,200	6,729,480	2,990,880	90	130	99	38,133,720	352,736,910
CY2019	6231	600	40	15%	44,863,200	6,729,480	2,990,880	90	130	96	38,133,720	390,870,630
CY2020	6231	600	40	15%	44,863,200	6,729,480	2,990,880	90	130	93	38,133,720	429,004,350
CY2021	6231	600	40	15%	44,863,200	6,729,480	2,990,880	90	130	90	38,133,720	467,138,070
CY2022	6231	600	40	15%	44,863,200	6,729,480	2,990,880	90	130	87	38,133,720	505,271,790
CY2023	6231	600	40	15%	44,863,200	6,729,480	2,990,880	90	130	85	38,133,720	543,405,510
CY2024	6231	600	40	15%	44,863,200	6,729,480	2,990,880	90	130	82	38,133,720	581,539,230
CY2025	6231	600	40	15%	44,863,200	6,729,480	2,990,880	90	130	80	38,133,720	619,672,950
CY2026	6231	600	40	15%	44,863,200	6,729,480	2,990,880	90	130	77	38,133,720	657,806,670
CY2027	6231	600	40	15%	44,863,200	6,729,480	2,990,880	90	130	75	38,133,720	695,940,390
CY2028	6231	600	40	15%	44,863,200	6,729,480	2,990,880	90	130	73	38,133,720	734,074,110

10. UPDATED: Provide detail on how the supported network has advanced telemedicine benefits:

a. Explain how the supported network has achieved the goals and objectives outlined in selected participant's Pilot Program application;
b. Explain how the supported network has brought the benefits of innovative telehealth and, in particular, telemedicine services to those areas of the country where the need for those benefits is most acute;
c. Explain how the supported network has allowed patients access to critically needed medical specialists in a variety of practices without leaving their homes or communities;
d. Explain how the supported network has allowed health care providers access to government research institutions, and/or academic, public, and private health care institutions that are repositories of medical expertise and information;
e. Explain how the supported network has allowed health care professional to monitor critically ill patients at multiple locations around the clock, provide access to advanced applications in continuing education and research, and/or enhanced the health care community's ability to provide a rapid and coordinated response in the event of a national crisis.

The NCTN has not started operation, but has already produced some telemedicine benefits. Notably, the exploration of the NCTN scope has raised awareness among a critical mass of players of the near-term need for higher bandwidth and more reliable connections for the vast majority of NCTN participants.

While the NCTN design will be a network with broad telemedicine capabilities, there are four "killer apps" that the NCTN will support. These four applications also can be instrumental parts of other telemedicine applications (e.g. teleconsulting, tele-education). A short description of these five applications will do the most to illustrate these key concrete NCTN-based telemedicine benefits.

1) The Health Information System (HIS) for NC Public Health Agencies. This new system is essentially a centrally provided Electronic Medical Record system including components used during clinical visits (e.g. patient encounter data entry) as well as real-time elements to support administrative needs (e.g. appointing, claims). It is intended to rollout in late 2008 to early 2009. The HIS is designed to provide better client service at lower cost and to provide higher quality health care services through better availability and integrity of relevant patient information. The centrally served architecture of HIS requires that each public health clinic user's workstation have an active session with the central servers (in Raleigh NC) whenever the system is being used. This, of course, implies that the network between the workstation and the central server must be available and responsive.

When the broadband network is not available or is not responsive, the repercussions range from slowed clinic work to closing clinics with attendant effects on patients from delay in care, economic effects from lost job revenue (as patients are delayed or come back for additional appointments),and loss/delay of job revenue for clinic workers when clinics close. Even the low end of these potential effects (e.g. slowed clinics) is likely disruptive enough that most clinics would abandon or minimize the use of HIS until a reliable and responsive network could be put in place. So, for this critical application, an NCTN-like service is an essential need.

When the HIS system well established, the ability to serve the public in clinics, to share a patient's information quickly and accurately with patient's other providers will be established. Having this ability to share data quickly and accurately is an essential part of many types of traditional telemedicine applications – especially telemedicine-based referrals. So, the success of HIS is a good building block for other telemedicine applications as well as bringing benefits on its own.

2) NCAFC EMR – The NC Association of Free Clinics' information systems strategy includes a commitment to create and operate a centrally served EMR for its approximately 76 member sites to support better care and lower care costs. As in the HIS case, there is a need for a higher-bandwidth and more reliable broadband connection than most free clinics now have. As in the HIS case, the failure to meet these network needs will almost certainly result in disruption of clinic services followed by rejection of the system and delay of reintroduction of the EMR until adequate broadband connections can be obtained and financed. The same logic about the EMR being a building block and supporting other telemedicine applications applies to this EMR as it did for the HIS.

3) LHD DISASTER RESPONSE – Over the last few years, several networked information tools have been developed to support the coordination of public health response service during public disasters (e.g. hurricanes, floods, tornadoes, ice storms, bio-events). Many of these events by their nature are likely to disrupt ordinary broadband services. Currently, most local health departments depend on ordinary broadband services for their access to these networked disaster tools and depend on a growing list of networked information services that are needed at all times (e.g. HIS). Local health departments are thus at risk of not being able to gain the benefit of these tools at the point in time that they are most needed- during a disaster. The NCTN will be designed to support operations using these tools under these circumstances.

This enhanced level of network reliability will likely have a secondary effect on the value gained from all applications: the willingness to (rationally) depend on the network being up and responsive will encourage all users to develop and use higher-value program elements. For example, if you are going to design a program to provide remote telemedicine consults in medical emergencies (e.g. using echocardiography to evaluate newborns in distress), you can rationally base the program design only on a very highly reliable network. If implementing this tele-consulting application included gaining access to a patient's records in HIS, the benefit of the reliability of the network supporting the HIS access would be higher, though the costs would not go up.

4) NCAFC VOIP – Part of the NCAFC's information services strategy calls for the use of voice over IP services as the mainstay for voice services at the 76 free clinics. This is envisioned as a way to add services and lower costs. But, this can only be done with a broadband network with sufficiently low latency and high reliability. Ordinary broadband, especially in rural areas, does not routinely have these qualities at a sufficient level to support this use. The NCTN is the mechanism that is designed to provide these qualities.

5) Tele-education – Since the project started, many of the public health agencies have noted that they would save significant funds if they made more use of remote video-based education opportunities. The desire to make more use of tele-education has risen in the last few months as budgets are constrained at the same time that more service is being asked of the NCTN members. Today, tele-education opportunities are not viable for many NCTN members because adequate broadband facilities are either not available or are too costly. The NCTN project is designed to provide these opportunities.

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August, September, October: The University of North Carolina's School of Medicine has expressed an interest in creating telehealth services for the local health departments that will depend on the NCTN as part of their legislatively funded obligation to provide outreach services in NC. The effort is led by UNC's CIO, Lawrence Conrad. Throughout August and September we identified the UNC-internal parties who should participate in exploring the option set. A first set of potential collaborators, including e-NC and Kirby IMC, met in October to see how to move this interest forward and is proceeding now to locate the best options for meeting this service objective.

July 2009 – One recent accomplishment is this area has been the development of a recognition in the state's health IT strategy that broadband connections for providers are an essential part of succeeding at all health IT activities (especially telemedicine, HIE, EHR usage, PHR usage). This point of view was prompted partially by the visibility of the RHCPP project in the state.

October 2009 – With the merger of the three other NC RHCPP projects, the NCTN now will connect virtually all of the hospitals in NC. This additional connected group will add a new set of parties interested in various forms of telemedicine that are common in hospitals – e.g. tele-consulting with ICU,NICU patients, tele-education for hospital staff (or as a service for local providers)). This set of connections also allows us to include hospitals in IT-enabled disaster response elements along with the public health agencies and free clinics. We are also now able to provide networking support for those hospitals who wish to use ASP-modeled EHRs and oher HIT/HIE services as part of their approach to meeting "Meaningful Use of EHR" criteria under the HITECH Act. Collectively, the network now is planned to support the vast majority of care providers for vulnerable populations in NC.

11. UPDATED: Provide detail on how the supported network has complied with HHS health IT initiatives:

a. Explain how the supported network has used health IT systems and products that meet interoperability standards recognized by the HHS Secretary;
b. Explain how the supported network has used health IT products certified by the Certification Commission for Healthcare Information Technology;
c. Explain how the supported network has supported the Nationwide Health Information Network (NHIN) architecture by coordinating activities with organizations performing NHIN trial implementations;
d. Explain how the supported network has used resources available at HHS's Agency for Healthcare Research and Quality (AHRQ) National Resource Center for Health Information Technology;
e. Explain how the selected participant has educated themselves concerning the Pandemic and All Hazards Preparedness Act and coordinated with the HHS Assistant Secretary for Public Response as a resource for telehealth inventory and for the implementation of other preparedness and response initiatives; and
f. Explain how the supported network has used resources available through HHS's Centers for Disease Control and Prevention (CDC) Public Health Information Network (PHIN) to facilitate interoperability with public health and emergency organizations.

While the NCTN is not operational yet, our plan for the NCTN design, implementation, and operation to support these initiatives is formed. Notably:

- We plan to require NCTN products/services that meet the interoperability standards recognized by HHS. We will encourage the use of such products for those who operate services that use such products over the NCTN (e.g. HL7 in health data transmissions).

- CCHIT does not yet certify products that the NCTN would directly use, but CCHIT standards require the use of various open networking protocols (e.g. SSL, IPSec) by those who may use CCHIT-certified products (e.g. EMRs) in ways that employ the NCTN (e.g. movement of lab results). Our plan is for the NCTN to support these open protocols to allow CCHIT products to operate in a certified way and to encourage the adoption of CCHIT products among NCTN subscribers.

- Many of the principal actors in forming the NCTN are also active members of organizations involved in the NHIN trials. Notably, CHA, the NC Association of Local Health Directors, the NCAFC, the NC Division of Public Health, and KirbyIMC are all active members of NCHICA (the North Carolina Healthcare Information and Communication Alliance). NCHICA is one of the NHIN Trial Implementers and this group of NCHICA members has been active in forming and following the approach to this NHIN-centric work and other related projects.

- The AHRQ's HealthIT site is a great resource for the evidence base for the use of information in health-related activities. Many of these activities include broadband networks. But, the AHRQ site does not seem to have much helpful material associated with designing or operating broadband nets to support these uses. The site's data will likely be of much more use to us as various NCTN users focus on the types of uses of broadband that are the mainstay of this web site.

- With regard to the Pandemic All Hazards Preparedness Act, we have made direct contact with the Asst. Secretary to request his guidance, which is pending. In the interim, we plan to include supportive elements in the NCTN design. Note that the reliability measures in the NCTN will include high reliability in the face of pandemics that may significantly reduce availability of the workforce that maintains broadband facilities – especially in rural areas.

- With regard to the CDC's PHIN, we have included on our team the North Carolina PHIN Compliance Coordinator and plan to use his inputs to assure that the NCTN can support PHIN-compliant applications. We are participating with other RHCPP members in a collaboration requested by CDC (Dr. Charles Magruder) to determine how to best integrate PHIN needs with RHCPP projects.

-We have led the development of a security workshop for RHCPP members and sponsored by the VA at the upcoming (3/1) Academic Medical Center Privacy and Security Conference.

-Since the HITECH Act was passed in February 2009, the NCTN has become more important to subscribers as they move to comply with the various aspects of the Act that use broadband facilities. Notably, there are Meaningful Use objectives that relate to use of Health Information Exchange and electronic reporting to HHS. In addition, other meaningful sue regruiements are lilkey to be met with ASP-modeled facilities (which, of course, require a highly-reliable broadband connection).

12. UPDATED Explain how the selected participants coordinated in the use of their health care networks with the Department of Health and Human Services (HHS) and, in particular, with its Centers for Disease Control and Prevention (CDC) in instances of national, regional, or local public health emergencies (e.g., pandemics, bioterrorism). In such instances, where feasible, explain how selected participants provided access to their supported networks to HHS, including CDC, and other public health officials.

Most of the NCTN public health agency sites and even many of the free clinics are expected to be operational during a disaster both for normal services and in support of disaster response. Virtually all of the hospitals also run emergency departments with disaster response responsibilities. Many public health sites are also community centers for disaster response – partnering with other government units (e.g. the county sheriff's office) and NGOs (e.g. the Red Cross). So, being involved in preparing for, training for, and executing disaster response is part of the basic mission of most NCTN subscribers. One key NCTN team member – the NC Division of Public Health – has an overall coordination role in the area of public health emergencies and generally requires the close cooperation of local health departments (all of which are expected to be NCTN members) in carrying out this role.

To date, our main form of specifically assuring that the NCTN can support use of the network by HHS, CDC, and other public health officials has been to make PHIN compliance a basic goal and to involve the state's PHIN coordinator as a project team member. As the design details are

filled in and the network is implemented and operated, we will call on this partnership to assure that the needs to support response to public health emergencies are fulfilled.

August, September, October 2008 – The NCTN collaborators regularly work with the Internet2 working group associated with the RHCPP. As part of our effort, we composed a panel at the latest I2 meeting in October on how RHCPP participants could support PHIN and related CDC activities. A key design factor for the NCTN is to have disaster-proof reliability that can support public health agencies as they monitor and respond to disasters. This factor was described in the session for other RHCPP selectees.

Dr. Charles Magruder, a coordinator of health information exchange activities at CDC's National Center for Public Health Informatics, was recruited to present in collaboration with the panel. That interaction has led to intent to more deeply involve the interested RHCPP projects with Dr. Magruder's work and may provide some support funding for doing so.

NC PHIN: Public Health Activities and Disaster Management - Over the last few years several information systems have been implemented to create the North Carolina Public Health Network (NC PHIN). NC PHIN supports public health activities at state and local levels and also provides coordination and integration between state and local health departments with Centers for Disease Control (CDC). These activities include disaster management services during both man-made and natural disasters (e.g. hurricanes, floods, tornadoes, ice storms, pandemics, bioterrorism events). Many of these disaster events present high risks for disrupting ordinary broadband services that NC PHIN users depend on and thus would endanger lives and threaten the public well-being.

Systems that comprise NC PHIN are client/server architectures with all servers centralized in the Raleigh data center and client access at the local levels via the Internet. The NCTN will be designed to ensure availability for timely and reliable access to NC PHIN systems to provide critical tools that support local health departments' processes. Local health departments must have timely, accurate and appropriate information to effectively serve their communities, to promote health and to make potentially life-saving decisions that protect the public from health threats. A dynamic network is very important for collaboration with both other state and federal public health resource responders.

NCTN is key for NC PHIN to be compliant with the PHIN 2.0 Requirement that each local health departments ensure that its electronic information systems that support PHIN requirements have the appropriate level of availability and that an Internet connection is available to support data exchange and interoperability initiatives.

The public health systems that comprise NC PHIN and the activities supported include:
1) NC HAN – Provides health alerts and information between local, state public health departments, CDC and private health providers.
2) NC EDSS – Supports outbreak management, countermeasures and response management, routine disease surveillance and disease reporting.
3) NC DETECT – Provides early event detection and syndromic surveillance.
4) NC LIMS – Connects the NC Public Health laboratory and private laboratories with other NC PHIN Systems to provide laboratory results.
5) NC PHIN Infrastructure – Provides 24/7/365 "five-nines" high availability and fault–tolerance systems design for central servers and applications at the state-level only.
6) UNC PH Lib - very interactive and data driven public health library at the Medical and Public Health Schools at UNC-CH.?